

What is claimed is:

(1) A curable homogeneous blend comprising:

- (a) a 1,2-polybutadiene oligomer having a number average molecular weight (Mn) of about 500 Daltons to about 50,000 Daltons,
- (b) a bis-phenol-A derivative that is end-capped with acrylate functionality, and
- (c) a reactive component that has at least one terminal double bond and that enhances the compatibility between the 1,2-polybutadiene oligomer and the acrylated bis-phenol-A derivative.

(2) A curable blend according to Claim 1 wherein the 1,2-polybutadiene oligomer has a number average molecular weight (Mn) of about 1,000 to about 5,000 Daltons.

(3) A curable blend according to Claim 1 wherein the 1,2-polybutadiene oligomer is a butadiene homopolymer.

(4) A curable blend according to Claim 3 wherein the butadiene homopolymer contains an amount of 1,4-polybutadiene.

(5) A curable blend according to Claim 4 wherein the 1,4-polybutadiene is present in an amount up to about 60% by weight based on the weight of the butadiene homopolymer.

(6) A curable blend according to Claim 1 wherein the 1,2-polybutadiene oligomer is a copolymer.

(7) A curable blend according to Claim 6 wherein the 1,2-polybutadiene copolymer is prepared from butadiene and a vinyl monomer that is a member selected from the group consisting of: styrene, vinyl acetate, divinyl benzene, isoprene, chloroprene,

1 alkyl acrylates, alkyl methacrylates, ethylene, propylene, butylene and mixtures  
2 thereof.

1 (8) A curable blend according to Claim 1 wherein the 1,2-polybutadiene oligomer is  
2 present in the blend in an amount of about 5% to about 50% based on weight.

1 (9) A curable blend according to Claim 1 wherein the bis-phenol-A derivative is an  
2 epoxy prepared from epichlorohydrin and bis-phenol-A.

1 (10) A curable blend according to Claim 1 wherein the bis-phenol-A derivative is  
2 ethoxylated.

1 (11) A curable blend according to Claim 1 wherein the reactive component is an  
2 aliphatic monofunctional or multifunctional acrylate or methacrylate.

3 (12) A curable blend according to Claim 11 wherein the acrylate or methacrylate is a  
4 member selected from the group consisting of: isodecyl acrylate, lauryl acrylate,  
5 lauryl methacrylate, nonyl phenyl acrylate, and dodecyl acrylate.

1 (13) A curable blend according to Claim 1 wherein the reactive component is a  
2 polyoxyalkylene monofunctional or multifunctional acrylate or methacrylate.

1 (14) A curable blend according to Claim 13 wherein the polyoxyalkylene  
2 monofunctional or multifunctional acrylate or methacrylate is a member selected  
3 from the group consisting of: 2(2-ethoxyethoxy) ethyl acrylate, 2[2-(2-  
4 ethoxyhexyloxy)ethoxy] ethyl acrylate, di(ethylene glycol) dimethacrylate,  
5 di(propylene glycol) diacrylate, and trimethylolpropane triacrylate.

1 (15) A curable blend according to Claim 1 wherein the reactive component is a  
2 compound substituted with long chain alkyl or alkoxy segments.

1     (16)   A curable blend according to Claim 15 wherein the substituted reactive component  
2           is a member selected from the group consisting of: alkoxyated nonyl phenol  
3           acrylate and alkoxyated nonyl phenol methacrylate.  
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- 1 (17) A curable blend according to Claim 1 wherein the reactive component is a  
2 heterocyclic reactive organic compound.
- 1 (18) A curable blend according to Claim 17 wherein the heterocyclic compound is a  
2 member selected from the group consisting of: n-vinyl pyrrolidone and methyl-n-  
3 vinyl pyrrolidone.
- 1 (19) A curable blend according to Claim 1 further comprising a hydroxy functional  
2 adhesion promoter.
- 1 (20) A curable blend according to Claim 19 wherein the hydroxy functional compound  
2 is a member selected from the group consisting of hydroxyethyl methacrylate and  
3 ethoxylated hydroxyethyl methacrylate.
- 1 (21) A curable blend according to Claim 1 further comprising a photoinitiator that  
2 initiates free radical crosslinking upon exposure to light.
- 1 (22) A curable blend according to Claim 21 wherein the photoinitiator is a member  
2 selected from the group consisting of (2,6-dimethoxybenzoyl)-2,4,4-  
3 trimethylpentyl phosphine oxide, 2-hydroxy-2-methyl-1-phenyl-propane-1, 1-  
4 hydroxy-cyclohexyl phenyl ketone, benzophenone and mixtures thereof.  
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1 (23) A curable blend according to Claim 1 further comprising a ground state catalyst  
2 that initiates free radical crosslinking upon exposure to heat.

1 (24) A curable blend according to Claim 23 wherein the ground state catalyst is a  
2 peroxide.

1 (25) A coated substrate wherein the coating comprises a crosslinked composition  
2 prepared from a homogeneous blend comprising:

- 3 (a) a 1,2-polybutadiene oligomer having a number average molecular weight  
4 (Mn) of about 500 Daltons to about 50,000 Daltons,  
5 (b) a bis-phenol-A derivative that is end-capped with acrylate functionality, and  
6 (c) a reactive component that has at least one terminal double bond and that  
7 enhances the compatibility between the 1,2-polybutadiene oligomer and the  
8 bis-phenol-A derivative.

1 (26) A coated substrate according to Claim 25 wherein the 1,2-polybutadiene oligomer  
2 has a number average molecular weight (Mn) of about 1,000 to about 5,000  
3 Daltons.

1 (27) A coated substrate according to Claim 25 wherein the butadiene homopolymer is a  
2 1,2-butadiene homopolymer.  
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- 1 (28) A coated substrate according to Claim 27 wherein butadiene homopolymer  
2 contains an amount of 1,4-polybutadiene.
- 1 (29) A coated substrate according to Claim 28 wherein the 1,4-polybutadiene is present  
2 in an amount up to about 60% by weight, based on the weight of the polybutadiene  
3 oligomer.
- 1 (30) A coated substrate according to Claim 25 wherein the 1,2-polybutadiene oligomer  
2 is a copolymer.
- 1 (31) A coated substrate according to Claim 30 wherein the 1,2-polybutadiene copolymer  
2 is prepared from butadiene and a vinyl monomer that is a member selected from the  
3 group consisting of: styrene, vinyl acetate, divinyl benzene, isoprene, chloroprene,  
4 alkyl acrylates, alkyl methacrylates, ethylene, propylene, butylene and mixtures  
5 thereof.
- 1 (32) A coated substrate according to Claim 25 wherein the 1,2-polybutadiene oligomer  
2 is present in the blend in an amount of about 5% to about 50% based on weight.
- 1 (33) A coated substrate according to Claim 25 wherein the bis-phenol-A derivative is  
2 prepared from epichlorohydrin and bis-phenol-A.  
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- 1 (39) A process for preparing a coated substrate comprising:  
2 (a) obtaining a substrate with a clean surface,  
3 (b) applying a coating to the substrate wherein the coating comprises a  
4 homogeneous blend comprising:  
5 (x) a 1,2-polybutadiene oligomer having a number  
6 average molecular weight ( $M_n$ ) of about 500 Daltons to about 50,000  
7 Daltons,  
8 (y) a bis-phenol-A derivative that is end-capped with  
9 acrylate functionality, and  
10 (z) a reactive component that has at least one terminal  
11 double bond and that enhances the compatibility between the 1,2-  
12 polybutadiene oligomer and the bis-phenol-A derivative, and  
13 (c) exposing the homogeneous blend to radiant energy.
- 1 (40) A process for preparing a coated substrate according to Claim 39 wherein the  
2 radiant energy is derived from a source which is member selected from the group  
3 consisting of electron beam, ultraviolet, radiofrequency, infrared, and combinations  
4 thereof.
- 1 (41) A process for preparing a coated substrate according to Claim 40 wherein the  
2 substrate is a metal that couples in a radiofrequency induction field to generate heat  
3 and initiate catalyst activity.  
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